ELECTRONIC APEX LOCATORS

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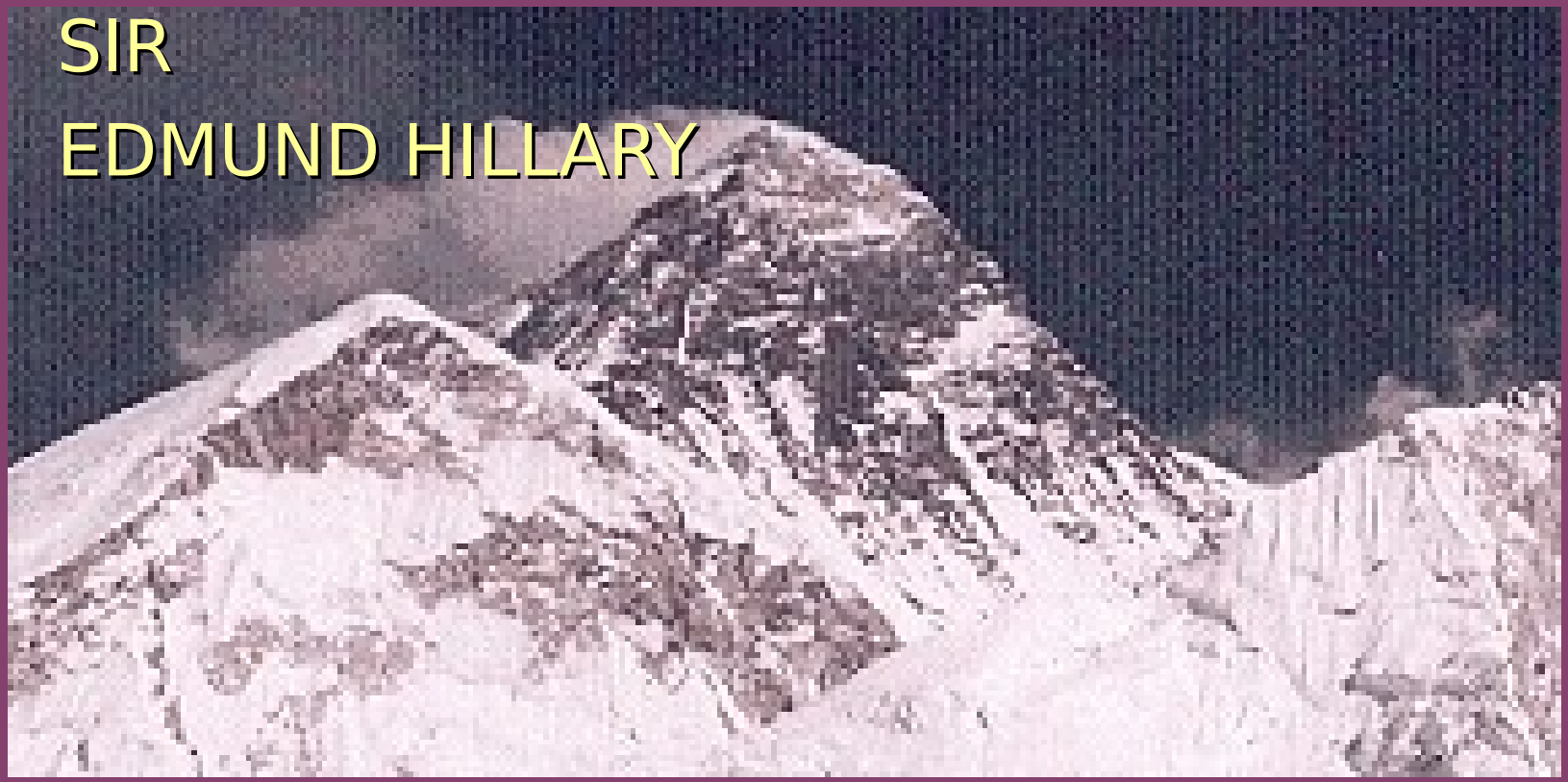
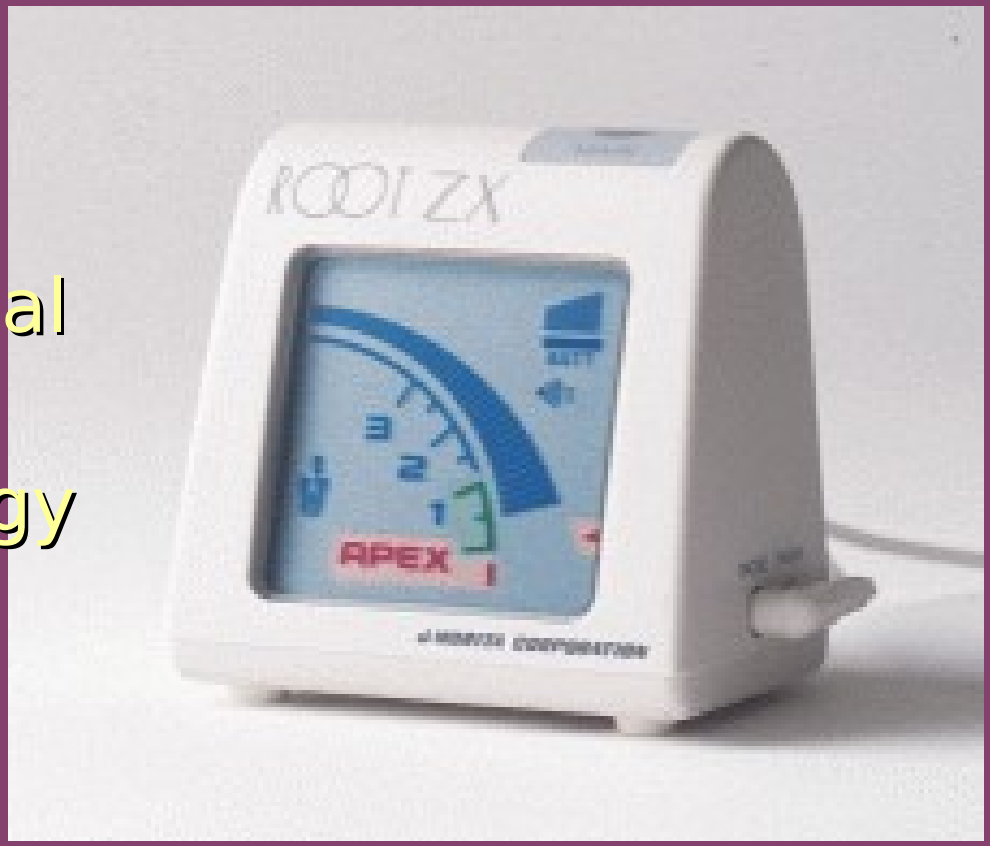
Apex Locators



APEX LOCATORS

Locating the Apical Foramen with Modern Technology



Electronic Apex Locators

HISTORY:

Suzuki (1942)- Consistent electrical resistance between instrument in a root canal and an electrode on the mucosa.

Electronic Apex Locators

History:

- The Resistance Method
- Sunada (1962)
- Root (19

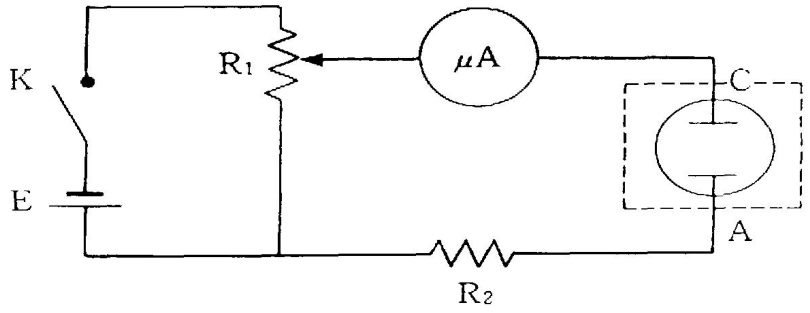


Fig. 1. Circuit of Sunada's method. *A*, Anode (Carr No. 1 reamer); *C*, cathode (oral mucus membrane electrode); *E*, battery; *K*, switch; *R1*, variable resistor; *R2*, resistor; *μA*, galvanometer.

Electronic Apex Locators

History:

Change in Frequency

Inoue (1971)

Sono-Explorer

Not a type of Sonar

Electronic Apex Locators

History:

High Frequency

Hasegawa (1979)

Endocator

able to make correct measurement in the presence of conductive fluids with specially coated file

Electronic Apex Locators

History:

Voltage Gradient

Ushiyama (1983)

Maximum potential obtained at the apical constriction

Electronic Apex Locators

History:

Relative Values of Frequency Response

Yamaoka (1984)

Apit (1989)

detects the apical constriction by calculation the difference between two direct potentials

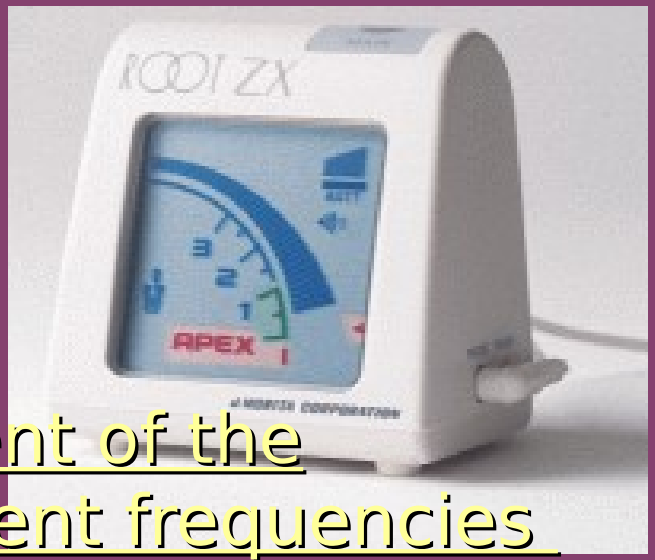
Electronic Apex Locators

History:

Ratio Method

Kobayashi (1991)

Root ZX



Simultaneous measurement of the impedance of two different frequencies

the quotient of which is expressed as the position of the electrode in the canal

Reliability

Apex locator is
more reliable
than radiograph

- Pratten and McDonald

Reliability

- Root ZX located Apex within .5mm 84.72% of the time in Vitro

  -Ounsi and Naaman

Reliability

- Root ZX located Apex within .5mm 96.2% of the time in Vivo

  -Shabahang and others

Reliability

Root ZX

more accurate than the

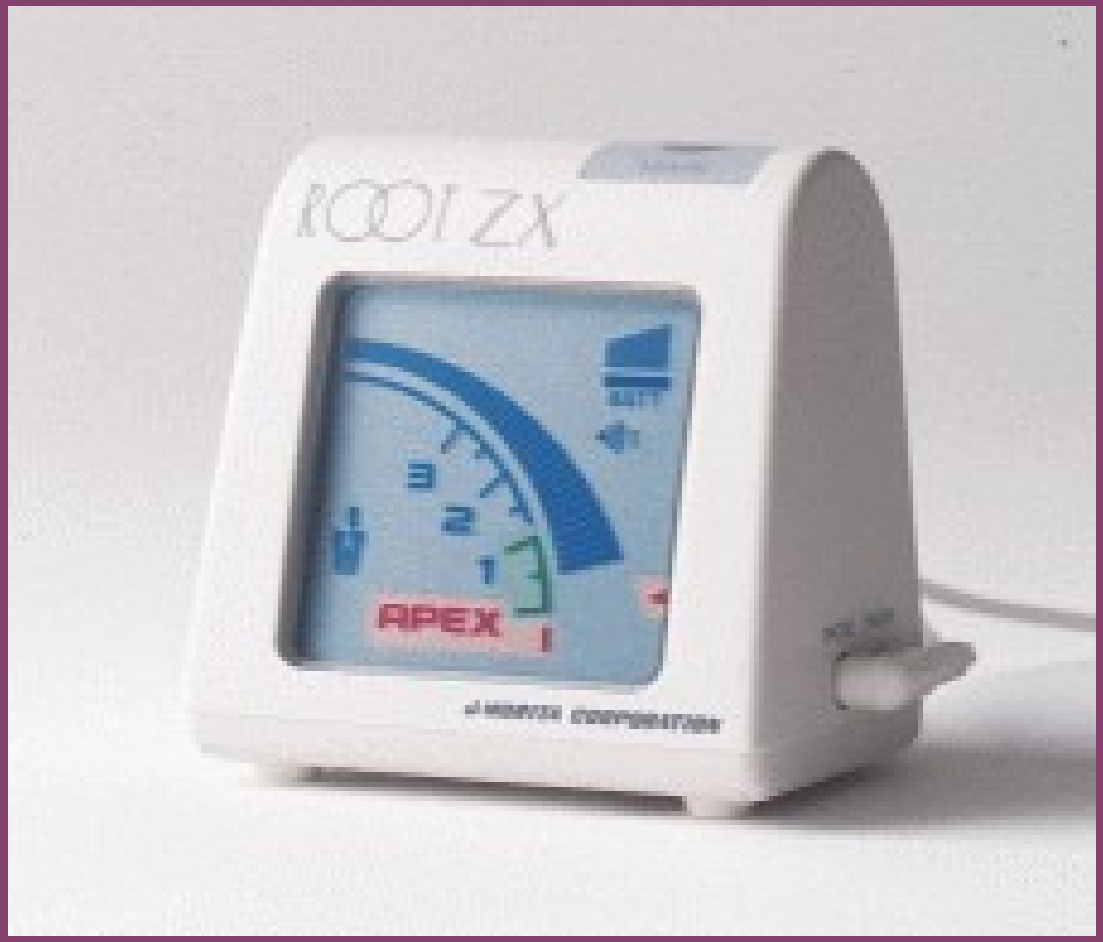
Apit

-Weiger and others

Using an Electronic Apex Locator

- Check electrical connections
- Beware of cervical leakage
- Keep the pulp chamber dry
- Keep the canal wet
- Beware of high readings in long roots
- Lateral canals may give false readings
- Not for use with open apex

Using The Root ZX



Using The Root ZX

- Turn on the unit before plugging in attachments
- Dry the pulp chamber
- Advance the file until an apex reading is obtained
- Take multiple readings before instrumenting the canal

Trouble Shooting

Check

- Batteries
- Connections
- Volume adjustment
- All parts clean and free of corrosion

Trouble Shooting

The meter in the display does not move

- Calcified canal
- Canal obstructed
- Dry canal
- Root form restricts navigation
- Apex surrounded by pustule

Trouble Shooting

Meter overreacts as file enters the canal

- Large foramen (self correcting)
- Pulp chamber wet
- Perforation
- Small File
- Pulp in canal
- File touching metal restoration
- Leaking restoration

Trouble Shooting

Meter gives erroneous readings

- Retreatment of silver points
- Large lateral canal
- Perforation
- Incomplete apex

Testing Your Unit

Place the file holder and lip clip placed 1 cm apart on your moistened finger.

This should give a consistent reading.

Electronic Apex Locators

- Questions ?
- Comments ?
- Complaints ?

Happy Mardi Gras